

•EFFECT OF ABRUPT SALINITY CHANGE ON OSMOTIC REGULATION IN ATLANTIC MENHADEN, *Brevoortia tyrannus*. W. Hettler, D. W. Engel, and D. E. Hoss. Rapid salinity fluctuations can occur in estuarine zones as a result of natural causes or man's activity. Depending on the rate and magnitude, salinity changes can cause severe stress among some estuarine animals. Studies were conducted to test the effect of the most severe salinity shock on juvenile Atlantic menhaden.

Four hundred Atlantic menhaden (wet wt. 25-35 g) acclimated for two weeks at low (3-4 ppt) and high (30-34 ppt) salinity and 26-27° C were subjected to abrupt salinity reversal, i.e., fish in low salinity were moved to high salinity and vice versa. At various periods of time after salinity reversal we measured the osmotic pressure in blood and the concentration of Na⁺, Cl⁻, and K⁺ ions in blood and muscle and compared them to control values. Serum values for control fish at high salinity were: osmotic pressure = 362.8 ± 7.0 mOsm/l, Na⁺ = 184.4 ± 7.6 , Cl⁻ = 139.7 ± 1.5 , and K⁺ = 3.7 ± 0.2 mEq/l. Controls at low salinity were: osmotic pressure = 349.7 ± 4.4 mOsm/l, Na⁺ = 155.2 ± 14.1 , Cl⁻ = 116.7 ± 1.4 , and K⁺ = 5.9 ± 0.3 mEq/l. No mortalities occurred during the salinity reversal.

Osmotic pressure and Na⁺ and Cl⁻ concentration responded to acute salinity reversal by increasing or decreasing in the direction of the salinity change for the first two days. Serum osmolarity in fish transferred to low salinity dropped 12%, N⁺ dropped 21%, Cl⁻ dropped 10%, and K⁺ increased 33%. From low to high salinity osmolarity increased 3%, Na⁺ increased 5%, Cl⁻ increased 18%, and K⁺ decreased 18%. After five days both osmotic pressure and ion concentration in serum stabilized to values expected for that salinity. Muscle ion concentration was not significantly affected by salinity shock.

These experiments were conducted on juvenile menhaden in the fall of the year when they normally emigrate from low salinities to high salinities. This may explain why there was less internal change in fish moved from low to high salinity.